



STANDARDIZATION OF ENHANCED PLASTIC MICROCIRCUITS FOR MILITARY APPLICATIONS

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MICROCIRCUIT PROGRAM HISTORY



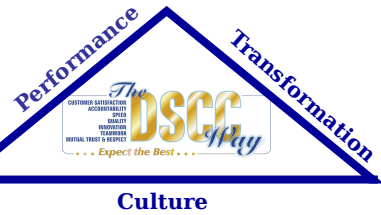
- MIL-M-38510 QPL PROGRAM
 - INACTIVATED 27 AUG 1993 – No Plastics devices
- MIL-PRF-38535 QML PROGRAM
 - CLASS N – FIRST ATTEMPT
 - EXTENDED TEMPERATURE, MILITARY TESTING TO COSTLY
- STANDARD MICROCIRCUIT DRAWINGS
 - STANDARD PROCUREMENT DOCUMENT FOR MIL-PRF-38535 DEVICES



NOW WHAT?



- REQUESTED BY USER COMMUNITY
ELECTRONICS INDUSTRIES ALLIANCE
(EIA)
G-12 COMMITTEE
- 5 YEAR EFFORT TO GET AGREEMENT ON
MINIMUM CHARACTERISTICS
- COVERS MANUFACTURERS ENHANCED
PLASTIC DEVICES
- NOT APPROPRIATE FOR ALL
APPLICATIONS



PROGRAM REQUIREMENTS

- MINIMAL ADDITIONAL COST - USERS
- AVAILABLE QUALIFICATION AND RELIABILITY DATA - USERS
- CHANGE NOTIFICATION - USERS
- COMMERCIAL PLUS - USERS
- CONTROLLED BASELINE - USERS
- NO EXTRAS - VENDORS
- NO ADDITIONAL MARKING - VENDORS
- SINGLE P. O. C. - BOTH



STANDARD PROCUREMENT DOCUMENT OPTIONS

- SLASH SHEETS, STANDARD MICROCIRCUIT DRAWINGS
- TRADITIONAL DSCC DRAWINGS
- COMMERCIAL ITEM DESCRIPTIONS
- NON-GOVERNMENT STANDARDS
- VENDOR ITEM CONTROL DRAWINGS (VIDs)



HOW DID WE GET HERE

DSCC Matrix of Document Options				
Document	Function	Controllin g Document	Controlli ng PIN	Sources
Slash sheets, SMDs	Document military QPL/QML devices	Slash sheet, SMD	Military	QML/QP L
DSCC Drawing - Selected Item , Source Control	Documents military grade parts that are not qualified	Drawing	Drawing	Approve d or Suggeste d
Commercial Item Descriptions (CID)	Documents commercial off-the- shelf parts.	CID	CID A-A-xxxxx	Open
Non-government Standards (NGS)	Documents parts developed under the consensus procedures of private sector standards organizations.	NGS	NGS	No QPL system for ICs
DSCC Vendor Item Drawing (VID)	Documents an off-the-shelf data sheet part	VID	Vendor	Suggeste d



HOW DID WE GET HERE

Document	Pros	Cons
Slash sheets, SMDs	Qualified part, standardization (part, document, qual), etc.	Covers military unique.
DSCC Drawing - Selected Item, Source Control	Standardization (part, document). Requirements can be added	IC Vendors not interested.
Commercial Item Descriptions (CID)	Standardization (part, document).	Off the shelf parts intended for commercial grade applications.
Non-government Standards (NGS)	Standardization (part, document). Represents industry consensus.	No source listing for ICs. NGS development time
DSCC Vendor Item Drawings	Standardization (part, document). Relies on the vendor part number. Flexible enough to cover enhanced plastics	Non-traditional PIN



VID CRITERIA



- CONTROLLED BASELINE
- CHANGE NOTIFICATION
- EXTENDED TEMPERATURE
- ACCESS TO QUALITY AND RELIABILITY DATA
- DMS NOTIFICATION AND SUPPORT



TI and National APPROACH



- SINGLE FAB, ASSEMBLY TEST SITE
- ENHANCED PRODUCT CHANGE NOTIFICATION OF PROCESS, MATERIALS, ELECTRICAL PERFORMANCE, LEAD FINISH, MOLDING COMPOUNDS AND MANUFACTURING LOCATIONS
- EXTENDED TEMPERATURE PERFORMANCE
- ENHANCED PEDIGREE - RELIABILITY AND ELECTRO MIGRATION CHECKS, ELECTRICAL CHARACTERIZATION OVER TEMPERATURE AND CONFIRMATION OF PACKAGE PERFORMANCE OVER TEMPERATURE
- ENHANCED OBSOLESCENCE MANAGEMENT



MICROCIRCUIT COMPARISON



COMMERCIAL

- 0°C to 70°C
- No reliability data readily available
- No Traceability - Multiple sites
- Limited DMS Support
- Limited Change Notification

ENHANCED

- -40°C to 85°C, -55°C to 125°C
- Quality/Reliability Data
- Controlled fab/assembly site(s)
- DMS Support and Notification
- Change Notification and Revision control

FULL MILITARY COMPLIANT DEVICES

- -55°C to 125°C Notification
- Military Qual/Reliability Data Management
- Full Wafer/Assembly Traceability Notification
- Required DMS
- DSCC Configuration
- Required Change



CURRENT SUPPLIERS



- TEXAS INSTRUMENTS
- NATIONAL SEMICONDUCTOR
- FREESCALE (MOTOROLA) - Pursuing
- INTERNATIONAL RECTIFIER - Pursuing



OTHER INTERESTED PARTIES



- XILINX
- ANALOG DEVICES
- CYPRESS
- INTEL
- IDT



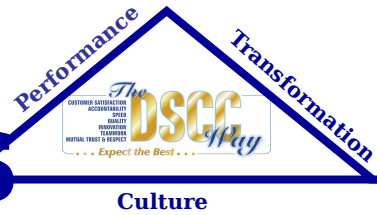
VID PROGRAM BENEFITS



- STANDARD PROCUREMENT DOCUMENT
- REVISION CONTROL
- LOWER COST THAN TRADITIONAL MILITARY PARTS
- IMPROVED RELIABILITY AND CONTROL COMPARED TO TRADITIONAL COMMERCIAL PARTS
- NEWER TECHNOLOGIES AVAILABLE



PROGRAM STATISTICS



- CURRENTLY 204 VIDS
- 357 UNIQUE DEVICE TYPES
- 402 PART TYPES
- 17 IN PROCESS
- 177 AWAITING DATA
- VIDS CAN BE DOWNLOADED FROM:
<http://www.dsccl.dla.mil/programs/milspec/>



OTHER ACTIVITY



- AEROSPACE QUALIFIED ELECTRONIC COMPONENT DOCUMENT (AQEC)
 - BASELINE SET OF USER REQUIREMENTS
 - BEING DEVELOPED BY A CONSORTIUM OF MILITARY USERS AND COMMERCIAL AEROSPACE USERS.
- GEIA-STD-0002-1 DRAFT REVISION D
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FUTURE PLANS



- CONTINUE TO DEVELOP NEW SOURCES
- EXPAND PRODUCT OFFERINGS OF ENHANCED DEVICES
- POSSIBLE REFERENCE OF AQEC DOCUMENT
- CLOSE AVAILABILITY GAP BETWEEN STATE OF THE ART COMMERCIALY AVAILABLE AND HIGH RELIABILITY MILITARY PARTS
- CONTINUED EVOLUTION OF VIDS TO MEET USER NEEDS



SUMMARY

- **STANDARDIZATION OF ENHANCED PLASTIC A CHALLENGE**
- **VARIOUS DOCUMENTS TYPES WERE CONSIDERED**
- **DSCC VID CONCEPT BEST MEETS USER NEEDS**
- **STRONG INDUSTRY SUPPORT OF PROGRAM**
- **MAJOR SUCCESS**